REMARKS

The present amendment is responsive to the Office Action dated November 17, 2005. Claims 1, 2, 11, 26, 27, 29, 30, 34 and 41 have been amended. New claim 45 has been added. No new matter has been added by the amendments or new claim. Support for the amendments and new claim may be found, by way of example only, in specification paragraphs 0085, 0098 and 0244, as well as original claims 5, 20 and 28. Claims 5, 20 and 28 have been canceled. Thus, claims 1-4, 6-19, 21-27 and 29-45 are presented for the Examiner's consideration in view of the following remarks. A petition for a one month extension of time is respectfully submitted herewith.

As an initial matter, claims 11, 30 and 34 were objected to based upon several informalities. The informalities have been remedied in accordance with the suggestions presented in the Office Action. Therefore, applicants respectfully submit that the objections to the claims be withdrawn.

Claims 1-7, 9, 11, 13 and 15 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,799,056 ("*Gutman*").

Claims 8, 12, 16 and 20-25 were rejected under 35 U.S.C. § 103(a) as being obvious over *Gutman* in view of U.S. Patent No. 5,142,561 ("*Doumas*").

Claims 8-19 were rejected under 35 U.S.C. § 103(a) as being obvious over *Gutman* in view of U.S. Patent No. 6,285,506 ("*Chen*").

Claims 26-29, 31-37 and 41-44 were rejected under 35 U.S.C. § 103(a) as being obvious over GB 2217036 ("*Rosser*") in view of *Gutman*.

Claims 38-40 were rejected under 35 U.S.C. § 103(a) as being obvious over *Rosser* in view of *Gutman* and an article by

Schuster et al. entitled "Laterally Graded Multilayer Optics for X-Ray Analysis ("*Schuster*").

Applicants respectfully traverse the rejections, which will be addressed in view of the amended claims.

Independent claim 1 now recites "An optical assembly comprising a laterally graded reflective multilayer having a reflecting surface to reflect incident X-rays under low incidence angles while producing a two-dimensional optical effect, said reflecting surface comprising a single surface conformed along two curvatures corresponding to two different directions; wherein said two different directions correspond respectively to sagital and meridional directions of the incident X-rays, and said reflecting surface has a sagital curvature radius of less than 20 mm."

Independent claim 26 now recites "A method of manufacturing an optical assembly comprising a laterally graded reflective multilayer having a reflecting surface to reflect incident X-rays under low incidence angles while producing a two-dimensional optical effect, said reflecting surface comprising a single surface conformed along two curvatures corresponding to two different directions, the method comprising: providing a substrate having a curvature along a first direction; coating the substrate; and curving the substrate along a second direction different than the first direction; wherein one of the first or second directions is a sagital direction of the incident X-rays, and the curvature of the substrate corresponding to the sagital direction defines a radius of curvature which is less than 20 mm."

Independent claim 41 now recites "A device for generating and conditioning X-rays for angle-dispersive X-ray reflectometry, the device comprising: an optical assembly comprising a laterally graded reflective multilayer having a reflecting surface to reflect incident X-rays under low

incidence angles while producing a two-dimensional optical effect, said reflecting surface comprising a single surface conformed along two curvatures corresponding to two different directions, said two different directions corresponding to sagital and meridional directions of the incident X-rays, and said reflecting surface has a sagital curvature radius of less than 20 mm; and a source of the incident X-rays coupled to the optical assembly so the incident X-rays are conditioned along two dimensions to adapt a beam emitted by the source in destination of a sample, with the X-rays having different angles of incidence on the sample."

Gutman, which is cited in all of the rejections, relates to "producing flat and curved optical elements with laterally and depth graded multilayer thin films." (Abstract) The methods disclosed in *Gutman* concern the production of multilayer optical assemblies curved along one curvature, and adjustments are of one curvature only. (*See, e.g.*, col. 4, line 61 to col. 5, line 25.) As discussed at col. 5, ll. 8-18, the step of curving along one dimension is made from a flat substrate. This necessarily results in an optical assembly curved along one dimension.

The Office Action cites to col. 4, ll. 45-47 for the proposition that *Gutman* teaches a reflecting surface (an "aspherical surface") comprising a single surface conformed along two curvatures corresponding to two different directions, and the surface being a smooth surface. (Office Action, numbered section 2, page 3.) The cited portion of *Gutman* states "The curvature of the substrate 4 may take the form of a section of an elliptical cylinder, a parabolic cylinder or an aspherical surface." Here, the curvature of the substrate is referred to as the section of the aspherical surface and not as a surface itself. Thus, *Gutman* neither teaches nor suggests a single

surface conformed along two curvatures corresponding to two different directions.

Notwithstanding this fundamental deficiency of *Gutman*, claim 1 has been amended to include the limitations of dependent claims 5 and 20 to further recite "wherein said two different directions correspond respectively to sagital and meridional directions of the incident X-rays, and said reflecting surface has a sagital curvature radius of less than 20 mm." Claims 26 and 41 have been similarly amended. Neither *Gutman* nor the other art of record, either alone or in combination, teaches these limitations.

Having a sagital radius of curvature of less than 20 mm enables one to work with very short source/point of focusing distances. As stated in the instant application, "And curvature radius Ry (sagital curvature radius) can have (in this embodiment as in the others) a value of less than 20 mm required for focalizations over short distances, less than 90 cm (source-focalization point distance) according to a preferred application of the invention." (Specification, ¶ 0162) The application also states "allowing surfaces to be constituted along an extremely reduced sagital curvature radius Ry, of a value for example that is less than 20 mm (making focalization possible for example along a source--focalization point distance of less than 90 cm)." (Specification, ¶ 0215) Short distance focalization also enables compact optical systems to be produced.

While much of the art of record such as *Gutman* does not mention a radius of curvature at all, those references that do, such as *Doumas* and *Rosser*, provide examples which are considerably larger than what is claimed.

According to the Office Action, *Doumas* teaches a "reflecting surface has a sagital curvature radius of less than 20 mm. (See Col. 4, line 11-26 for specifications on four

embodiments where the sagital curvature radius ranges from 16 cm to 23 cm. Coating of the surface with a laterally graded multilayer would increase intensity of the reflected beam due to the increased surface area contributing to the reflection while maintaining the original curvature of the substrate, i.e. original reflecting surface.)" (Office Action, numbered section 3, page 6.) The cited portion of *Doumas* states:

> In a first modification, the first radius is in the range of approximately 100 to 150 meters and the second radius is in the range of approximately 185 to 220 millimeters.
>
> In a second modification, the first radius is in the range of approximately 100 to 150 meters and the second radius is in the range of approximately 170 to 220 millimeters.
>
> In a third modification, the first radius is in the range of approximately 100 to 150 meters and the second radius is in the range of approximately 160 to 210 millimeters.
>
> In a fourth modification, the first radius is in the range of approximately 110 to 160 meters and the second radius is in the range of approximately 190 to 230 millimeters.

Thus, it can be seen that reference is made to a "second radius" in four sets of ranges. *Doumas* does not mention a sagital direction at all. Even more importantly, the lowest portion of the range of the "third modification" is at 160 mm, and the highest portion of the range of the "fourth modification" is at 230 mm. However, this is not what has been claimed in either independent claim 1 or in independent claims 26 and 41. Independent claims 1 and 41 both require a "sagital curvature radius of less than 20 mm" and claim 26 requires that "the curvature of the substrate corresponding to the sagital direction defines a radius of curvature which is less than 20 mm." The ranges relied on in *Doumas* are <u>an order of magnitude greater</u> than what is claimed, and there is no teaching or

suggestion in *Doumas* to use a radius smaller that in the different modifications relied on in the Office Action.

The Office Action also states that *Rosser* "further teaches the curvature of the substrate corresponding to the sagital direction of the optical assembly defines a radius of curvature which is less than 20 mm. (See Table 1 on page 13)" (Office Action, numbered section 5, page 11.) Table 1 ("Cylinder-toroid parameters") shows:

number	n	r (mm)	r' (mm)
1 (top)	-0.4	413	165
2	-0.6	251	150
3	-0.66	222	146
4	-0.68	213	145
5	-0.70	205	144
6	-0.80	172	138
7	-1.00	127	127
8(bottom)	-1.20	98	118

As with *Doumas*, the radius ranges presented in *Rosser* are significantly larger that what is claimed. Even the smallest radius of *Rosser* ("r" for number 8) is nearly 5 times greater that a radius of curvature less than 20 mm.

In view of the foregoing, it is respectfully submitted that independent claims 1, 26 and 41 patentably distinguish over *Gutman*, *Rosser* and *Doumas*, both individually and in the combinations that the Office Action suggests can be made therefrom. The other art of record does not overcome the deficiencies of these references. Therefore, applicants respectfully request reconsideration and allowance of independent claims 1, 26 and 41.

Furthermore, claims 2-4, 6-19, 21-25, 27, 29-40 and 42-45 depend from independent claims 1, 26 and 41 and contain all of the limitations thereof as well as other limitations that are neither disclosed nor suggested by the prior art of record.

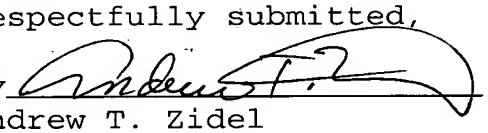
Accordingly, applicants submit that the subject dependent claims are likewise patentable.

As it is believed that all of the rejections set forth in the Office Action have been fully met, favorable reconsideration and allowance are earnestly solicited.

If, however, for any reason the Examiner does not believe that such action can be taken at this time, it is respectfully requested that he telephone applicant's attorney at (908) 654-5000 in order to overcome any additional objections which he might have. If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

Dated: March 17, 2006

Respectfully submitted,

By 

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